

An X-ray Survey of Wolf-Rayet Stars in the Magellanic Clouds.

II. The ROSAT PSPC and HRI Datasets

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ABSTRACT

Wolf-Rayet (WR) stars in the Magellanic Clouds (MCs) are ideal for studying the production of X-ray emission by their strong fast stellar winds. We have started a systematic survey for X-ray emission from WR stars in the MCs using archival *Chandra*, *ROSAT*, and *XMM-Newton* observations. In Paper I, we reported the detection of X-ray emission from 29 WR stars using *Chandra* ACIS observations of 70 WR stars in the MCs. In this paper, we report the search and analysis of archival *ROSAT* PSPC and HRI observations of WR stars. While useful *ROSAT* observations are available for 117 WR stars in the MCs, X-ray emission is detected from only 7 of them. The detection rate of X-ray emission from MCs WR stars in the *ROSAT* survey is much smaller than in the *Chandra* ACIS survey, illustrating the necessity of high angular resolution and sensitivity. LMC-WR 101-102 and 116 were detected by both *ROSAT* and *Chandra*, but no large long-term variations are evident.

Subject headings: surveys – Magellanic Clouds – stars: Wolf-Rayet – X-rays: stars

1. Introduction

Wolf-Rayet (WR) stars are characterized by their broad emission lines, indicating copious fast stellar winds. Spectral analyses of WR stars show typical wind terminal velocities of 1,000–3,000 km s^{−1} (Prinja, Barlow, & Howarth 1990) and mass loss rates of a few $\times 10^{-5} M_{\odot}$ yr^{−1} (de Jager, Nieuwenhuijzen, & van der Hucht 1988). Such powerful stellar winds are expected to generate a variety of X-ray sources. Within the WR wind itself, instability shocks produce regions with high temperatures and high densities for X-ray emission (Lucy & White 1980; Gayley & Owocki 1995). Upon leaving the WR star, the

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wind may encounter a massive companion’s wind, and the colliding winds produce compressed hot gas that emits X-rays. Finally, as the WR wind impinges on the ambient medium, a wind-blown bubble may form, and the shocked WR wind in the bubble interior may emit in X-rays (Weaver et al. 1977; García-Segura, Mac Low, & Langer 1996b; García-Segura, Langer, & Mac Low 1996a). Therefore, X-ray observations of WR stars provide an opportunity to probe the opacity of the stellar wind, study the orbital configuration of a WR+OB binary system, and examine the stellar mechanical energy injection into the interstellar medium.

Previous *Einstein* and *ROSAT* X-ray surveys of Galactic WR stars have shown that WR stars in binary systems have higher L_X/L_{bol} than single WR stars or O stars, and that single WN stars are generally brighter than WC stars, although no simple L_X/L_{bol} relationship appears to exist among single WN stars (Pollock 1987; Pollock, Haberl & Corcoran 1995; Wesselowski 1996). While these results reveal the potential of scientific yields from X-ray observations of WR stars, the Galactic sample is plagued by heavy obscuration in the Galactic plane that renders a large fraction of WR stars undetectable. The nearby Large and Small Magellanic Clouds (LMC & SMC) are ideal locations to expand the X-ray observations of WR stars, since the foreground and internal extinctions in these galaxies are small. Furthermore, their lower metallicities allow us to probe abundance effects on the stellar winds, and their known distances allow us to determine L_X with greater certainty.

In the first paper of this series (Guerrero & Chu 2007, hereafter Paper I), we have used the current archive of the *Chandra X-ray Observatory* to search for X-ray emission from WR stars in the Magellanic Clouds (MCs). This survey included useful ACIS observations for 70 of the 146 known WR stars in the MCs and resulted in credible detection of X-ray emission from 29 of these WR stars and possibly another 4 WR stars. Many of the WR stars in the MCs that have not been observed by *Chandra* have *ROSAT* X-ray observations available in the archive. In this paper, we have used the entire *ROSAT* archive of pointed observations to search for and analyze X-ray sources associated with WR stars in the MCs in order to complement our *Chandra* ACIS X-ray survey for WR stars in the MCs and to investigate long-term X-ray variability. In an upcoming paper (Carter et al., in preparation, Paper III), the results from the *ROSAT* and *Chandra* surveys of WR stars in the MCs will be complemented by an *XMM-Newton* survey. All three archival studies will be analyzed together in conjunction with a systematic spectroscopic search for binaries for all WR stars in the MCs (Bartzakos, Moffat & Niemela 2001; Foellmi, Moffat, & Guerrero 2003a,b, Schnurr et al., in preparation) to determine accurately the origin of X-ray emission from WR stars.

2. ROSAT Observations of WR Stars in the MCs

The *Röntgen Satellite* (*ROSAT*) had two types of X-ray detectors onboard - the Position Sensitive Proportional Counter (PSPC) and the High-Resolution Imager (HRI). The PSPC has an on-axis angular resolution of $\sim 30''$ and a spectral resolution of $\sim 45\%$ at 1 keV; it is sensitive in the energy range of 0.1–2.4 keV, and has a field-of-view of $\sim 2^\circ$. The HRI has a higher angular resolution, $\sim 5''$, but does not provide spectral resolution over the operational energy range of 0.1–2.0 keV; its field-of-view is $\sim 38'$. During the *ROSAT* mission from 1990 to 1999, numerous pointed observations of targets in the MCs were made, and the large field-of-view serendipitously included many WR stars. These observations can be retrieved from the *ROSAT* archive¹ maintained by the High Energy Astrophysics Science Archive Research Center (HEASARC) of Goddard Space Flight Center, NASA.

To search for X-ray observations of WR stars in the MCs, we used the lists of LMC WR stars compiled by Breysacher, Azzopardi, & Testor (1999) and SMC WR stars compiled by Massey, Olsen, & Parker (2003). We use only archival *ROSAT* observations with exposure times greater than 1 ks. The point-spread-function (PSF) and effective exposure of the telescope degrade significantly with distance from the field center; therefore, we select only PSPC observations with WR stars within the central $35'$ radius and HRI observations with WR stars within the central $18'$ radius. For PSPC observations with exposure times longer than 5 ks, we relax the selection criteria to include observations with WR stars within $35'$ to $40'$ from the central pointing. The search finds PSPC observations for 121 WR stars in the LMC and 11 WR stars in the SMC, and HRI observations for 110 WR stars in the LMC and 11 WR stars in the SMC. Tables 1 and 2 list, respectively, the available PSPC and HRI observations, exposure times, and offsets of WR stars from the central pointings. Multiple observations with the same instrument of a WR star were merged in order to increase the signal-to-noise ratio.

3. Results

X-ray images are extracted from the merged PSPC and/or HRI observations of each WR star in the MCs within the full spectral energy range, i.e., 0.1–2.4 keV for the PSPC and 0.1–2.0 keV for the HRI. A pixel size of $5'' \text{ pixel}^{-1}$ is used for the PSPC images and $2'' \text{ pixel}^{-1}$ for the HRI images. These images are subsequently smoothed with a Gaussian profile

¹*ROSAT* archival data can be obtained from the anonymous ftp site legacy.gsfc.nasa.gov, or downloaded from the web site <http://heasarc.gsfc.nasa.gov/W3Browse>.

of FWHM of $15''$ for the PSPC and $3''$ for the HRI. The smoothed images are used to search for X-ray emission at the location of WR stars. When X-ray emission is detected within $30''$ from the location of a WR star, we compare the X-ray images of the WR star with an optical image extracted from the Digitized Sky Survey² (DSS) to search for a point source at the location of the star or diffuse emission from its surrounding bubble, if it exists. To assess the reliability of these detections, we have defined a source region encompassing the X-ray source at the location of the WR star and an appropriate background region without sources, and computed the background-subtracted *ROSAT* PSPC and/or HRI counts within the source region using the IRAF³ PROS task *imcnts*. This has allowed us to confirm the $\gtrsim 3\sigma$ detections of X-ray emission from the 7 WR stars in the LMC listed in Table 3. The net count rates and net counts of these WR stars are listed in columns 5 and 6 of Tab. 3, respectively. No WR stars in the SMC are detected by *ROSAT*. The correlation between these detections and sources in different *ROSAT* catalogs is listed in Table 4. The *ROSAT* PSPC and HRI X-ray and DSS optical images of the WR stars detected in X-rays are presented in Figures 1 and 2. For the central regions of R 136 and R 140 (Fig. 2), only the HRI images are shown as the angular resolution of the PSPC observations is too poor to resolve these stars.

The WR stars in the MCs that are not detected by *ROSAT* observations are listed in Table 5. For these WR stars, we use source regions with sizes matching the PSF of *ROSAT* PSPC and HRI in order to determine their $3\text{-}\sigma$ upper limits using the IRAF PROS task *imcnts*. The radii of these source regions range from $20''$ to $60''$ for the PSPC and from $10''$ to $20''$ for the HRI, depending on the offsets of the WR stars from the central pointings. The resulting $3\text{-}\sigma$ upper limits are listed in column 5 of Tab. 5. The distribution of these upper limits indicates that most of the non-detections have HRI count rates $< 1.0 \times 10^{-4}$ cnts s⁻¹ and PSPC count rates $< 1.5 \times 10^{-4}$ cnts s⁻¹.

Several WR stars in the MCs are found to be embedded in diffuse X-ray emission or

² The Digitized Sky Survey (DSS) is based on photographic data obtained using the UK Schmidt Telescope and the Oschin Schmidt Telescope on Palomar Mountain. The UK Schmidt was operate by the Royal Observatory of Edinburgh, with funding from the UK Science and Engineering Research Council, until 1988 June, and thereafter by the Anglo-Australian Observatory. The Palomar Observatory Sky Survey was funded by the National Geographic Society. The Oschin Schmidt Telescope is operated by the California Institute of Technology and Palomar Observatory. The plates were processed into the present compressed digital form with the permission of these institutes. The Digitized Sky Survey was produced at the Space Telescope Science Institute under US government grant NAGW-2166.

³IRAF is distributed by the National Optical Astronomy Observatories, which is operated by the Association of Universities for Research in Astronomy, Inc. (AURA) under cooperative agreement with the National Science Foundation.

close to bright X-ray sources. The analysis of these sources is neither possible nor necessary, since *Chandra* observations provide a much clearer view. These include *ROSAT* PSPC observations of LMC-WR 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, and 116, all within $70''$ from R 136, and PSPC observations of LMC-WR 31, 81, 82, 84, 85, 88, 89, 91, 92, 93, 95, 117, 118, 119, 121, and 122, and of HD 5980 in the SMC, as they are embedded in diffuse X-ray emission. Similarly, no analysis was attempted for the *ROSAT* HRI observations of LMC-WR 99, 100, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, and 115 near R 136, the observations of LMC-WR 91 and 93 that are too close to bright X-ray sources, or the observations of LMC-WR 80, 85, 92, and 118, and HD 5980 in the SMC, which are superposed by bright diffuse X-ray emission.

3.1. Comparison Between the Chandra ACIS and ROSAT Surveys

The *Chandra* ACIS and *ROSAT* surveys for X-ray emission from WR stars in the MCs have many stars in common. LMC-WR 19, 20, 67, 78, 79, 119, 125, 126, and 127 are detected by *Chandra* ACIS, but not *ROSAT*. In all these cases, the *ROSAT* PSPC and HRI count rates expected from their *Chandra* ACIS count rates are below the $3\text{-}\sigma$ upper limit listed in Tab. 5. LMC-WR 101-102 and 116 in the LMC are detected both by *Chandra* ACIS and by *ROSAT* HRI. The *Chandra* ACIS count rates and spectral properties of these two sources (Paper I) correspond to *ROSAT* HRI count rates of 2.8×10^{-3} cts s^{-1} for LMC-WR 101-102, and $(4.5\text{--}6.3) \times 10^{-3}$ cts s^{-1} for the X-ray variable LMC-WR 116. These values are fairly consistent with the HRI count rates of these sources listed in Tab. 3.

3.2. X-ray Luminosity of the Wolf-Rayet Stars Detected by ROSAT

The *ROSAT* PSPC detections of WR stars in the MCs have yielded insufficient numbers of counts for spectral fits, and the *ROSAT* HRI observations do not provide spectral information. In order to estimate the X-ray luminosities of the WR stars in the MCs detected by *ROSAT*, we adopt the emission model that describes the integrated spectra of the weakly detected WR stars in the *Chandra* ACIS survey (Paper I), i.e., a thin plasma with a temperature of $kT = 1.6$ keV absorbed by intervening material with abundances of $0.33 Z_{\odot}$ and an absorption column density of $3 \times 10^{21} \text{ cm}^{-2}$. We have used PIMMS to convert the *ROSAT* PSPC and HRI count rates to X-ray luminosities in the 0.5-7.0 keV band and listed them in Tab. 3.

3.3. Remarks on Individual Objects

LMC-WR 10 (Brey 9) is at the core of the OB association LH 9 in N11 that includes up to 25 stellar components in a field of view $6''.4 \times 6''.4$ (Schertl et al. 1995; Bauer et al. 1996). Therefore, the X-ray emission reported in this paper may have an origin different from LMC-WR 10.

The X-ray emission from LMC-WR 38, 39 and 42 has been previously reported by Dunne, Points, & Chu (2001). LMC-WR 38 is also identified as source #538 by Haberl & Pietsch (1999). LMC-WR 38 (Brey 31) and 39 (Brey 32) are confirmed binary systems with periods of ~ 3 and ~ 2 days, respectively (Moffatt, Niemela, & Marraco 1990). Similarly, LMC-WR 42 (Brey 34) is a binary system but with a longer period, 30 days (Seggewiss, Moffat, & Lamontagne 1991).

The X-ray detection of LMC-WR 47 (Brey 39) needs to be examined carefully. LMC-WR 47 is located on an area of diffuse X-ray emission and its number of counts is only $\sim 3.5\sigma$ over the local background level of X-ray emission. Furthermore, the X-ray contours shown in Fig. 1 reveal a noticeable offset of $\sim 25''$ between the X-ray peak and the location of this WR star. Therefore, until new X-ray observations with better angular resolution of LMC-WR 47 are acquired, its X-ray detection reported in this paper should be considered tentative.

LMC-WR 101, 102, and 103 are in the visual multiple system R 140 near the core of 30 Doradus, of which LMC-WR 102 (R 140a2) is a close spectroscopic binary with a period of ~ 3 days (Moffat et al. 1987). LMC-WR 101, 102, and 103 were marginally detected by the *Einstein* High Resolution Imager (Wang & Helfand 1991). *ROSAT* made a clear detection, being listed as source #299 by Sasaki, Haberl & Pietsch (2000), but the X-ray emission of the different components was not individually resolved until the *Chandra* ACIS-I observations of the 30 Doradus nebula offered a sharper view of this region (Portegies Zwart, Pooley, & Lewin 2002; Townsley et al. 2006, Paper I). *Chandra* observations show that LMC-WR 101-102 (R 140a1 and R 140a2) are much brighter than R 140b (Portegies Zwart et al. 2002; Townsley et al. 2006, Paper I). The present analysis show that the level of X-ray emission in the *ROSAT* HRI and *Chandra* ACIS-I observations are consistent with each other. We note, however, that Wang (1995) reported a higher X-ray flux based on the *ROSAT* HRI observation rh600228 obtained in 1992 December and 1993 June. We have examined these individual observations, as well as the *ROSAT* HRI observation rh400779 (1996 August and 1997 April), and find that in all cases the HRI count rates remain at roughly a constant level consistent with the count rate of 2.9×10^{-3} cts s^{-1} reported in Tab. 3.

LMC-WR 116 (Brey 84) is also a WR star in the 30 Doradus region that was marginally

detected by the *Einstein* High Resolution Imager (Wang & Helfand 1991). Wang (1995) reported a *ROSAT* HRI count rate of 8.1×10^{-3} cts s $^{-1}$ based on the observation rh600228 obtained in 1992 December and 1993 June. A similar *ROSAT* HRI count rate of 8.5×10^{-3} cts s $^{-1}$ is reported by Sasaki et al. (2000) who assigned it the source number #301 in their catalog. The *ROSAT* HRI count rate reported in Tab. 3 is $\sim 40\%$ lower than the values reported by Wang (1995) and Sasaki et al. (2000) because we used a smaller source aperture to exclude the contribution from LMC-WR 112 (R 136c), LMC-WR 99 (Brey 78), and an X-ray bright source near LMC-WR 115 (Brey 83) north of Brey 84 (see Fig. 1d of Guerrero & Chu 2007). If contributions from these bright neighboring sources are added to our measurement, we recover the *ROSAT* HRI count rates reported by Wang (1995) and Sasaki et al. (2000). To further investigate possible long-term variations of this source, we have analyzed the individual *ROSAT* HRI observations rh500036 (1992 February), rh600228 (1992 December), and rh400779 (1996 August and 1997 April), and find HRI count rates of $(5.9 \pm 0.8) \times 10^{-3}$ cts s $^{-1}$, $(4.3 \pm 0.4) \times 10^{-3}$ cts s $^{-1}$, $(4.0 \pm 0.4) \times 10^{-3}$ cts s $^{-1}$, and $(4.9 \pm 0.3) \times 10^{-3}$ cts s $^{-1}$, respectively. These values are consistent with the *ROSAT* HRI count rate of $(4.5\text{--}6.3) \times 10^{-3}$ cts s $^{-1}$ expected from the *Chandra* ACIS observation of Brey 84; thus, there is no evidence for large long-term variations.

4. Summary

We have searched the entire *ROSAT* archive for pointed observations that serendipitously cover WR stars in the MCs. This search has yielded useful PSPC observations for 90 WR stars in the LMC and 10 WR stars in the SMC, and HRI observations for 87 WR stars in the LMC and 10 WR stars in the SMC. A total of 117 WR stars in the MCs have useful *ROSAT* observations.

We have examined the *ROSAT* observations of these 117 WR stars in the MCs and found X-ray emission from 7 of them, of which 5 had been previously reported to exhibit X-ray emission. We find that the X-ray detection of LMC-WR 10 (Brey 9) and LMC-WR 47 (Brey 39) need to be confirmed by X-ray observations at higher angular resolution. The detection rate, $\sim 6\%$, is much lower than that of the *Chandra* ACIS survey, 40–50%. This illustrates that the sensitivity and angular resolution of *Chandra* is needed to study WR stars in the MCs. Indeed, many WR stars detected by *Chandra* have X-ray emission at levels below the $3\text{-}\sigma$ upper limits of the available *ROSAT* observations, are located near bright X-ray sources, or are superposed on bright diffuse X-ray emission, making it difficult for *ROSAT* to detect them. Together, the *ROSAT* and *Chandra* surveys have detected X-ray emission from 34 WR stars in the MCs.

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Table 1. ROSAT PSPC Observations of WR Stars in the MCs

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 3	Brey 3	rp900320	31.3	23	LMC-WR 31	Brey 25	rp600099	8.8	37	LMC-WR 54	Brey 44a	rp180251	20.2	23
LMC-WR 5	Brey 4	rp500258	13.8	34			rp400154	6.5	2			rp180179	15.9	23
LMC-WR 6	Brey 5	rp500263	12.7	2			rp500093	8.7	4			rp500100	26.6	23
LMC-WR 7	Brey 6	rp500263	12.7	21	LMC-WR 32	Brey 26	rp400263	24.1	24	LMC-WR 55	Sk $-69^{\circ}175$	rp500138	31.6	31
LMC-WR 9	Brey 7	rp600098	10.5	25	LMC-WR 33	Sk $-68^{\circ}73$	rp400154	6.5	5			rp500140	40.0	23
		rp600577	9.0	25			rp500093	8.7	8			rp500303	9.4	23
		rp900320	31.3	11	LMC-WR 34	Brey 28	rp400263	24.1	39			rp600100	22.7	23
LMC-WR 10	Brey 9	rp600098	10.5	21	LMC-WR 35	Brey 27	rp500062	5.9	14			rp180251	20.2	24
		rp600577	9.0	21			rp600578	10.5	25			rp180179	15.9	24
		rp900320	31.3	0			rp600099	8.8	25	LMC-WR 56	Brey 46	rp500100	26.6	24
LMC-WR 11	Brey 10	rp500258	13.8	18	LMC-WR 36	Brey 29	rp500138	31.6	23			rp500138	31.6	30
LMC-WR 12	Brey 10a	rp500263	12.7	32	LMC-WR 37	Brey 30	rp500062	5.9	15			rp500140	40.0	24
LMC-WR 13	Sk $-66^{\circ}40$	rp600098	10.5	16			rp600578	10.5	9			rp500303	9.4	25
		rp600577	9.0	16			rp600099	8.8	9			rp600100	22.7	23
		rp900320	31.3	8	LMC-WR 38	Brey 31	rp400154	6.5	35	LMC-WR 57	Brey 45	rp500054	7.9	34
LMC-WR 14	Brey 11	rp500258	13.8	19			rp500054	7.9	1			rp500054	7.9	35
LMC-WR 15	Brey 12	rp500060	3.9	33			rp500093	8.7	34			rp900536	1.0	34
LMC-WR 16	Brey 13	rp600098	10.5	24	LMC-WR 39	Brey 32	rp142564	2.7	32			rp900536	1.4	32
		rp600577	9.0	24			rp500138	31.6	1			rp900539	1.4	17
LMC-WR 19	Brey 16	rp300129	4.0	18	LMC-WR 40	Brey 33	rp500138	31.6	1			rp900541	1.0	24
		rp500037	6.8	10	LMC-WR 41	Brey 35	rp500138	31.6	17			rp900549	1.3	26
LMC-WR 20	Brey 16a	rp300129	4.0	18	LMC-WR 42	Brey 34	rp500138	31.6	1			rp900552	1.1	29
		rp500037	6.8	10	LMC-WR 43	Brey 37	rp300172	13.1	28			rp900553	1.2	24
LMC-WR 21	Brey 17	rp500052	12.4	2	LMC-WR 44	Brey 36	rp141507	1.3	33	LMC-WR 58	Brey 47	rp500138	31.6	38
LMC-WR 22	Brey 18	rp180033	3.6	19			rp141508	1.1	31	LMC-WR 60	Brey 49	rp110167	2.3	28
		rp900398	12.4	20			rp141518	1.3	32			rp110173	2.0	11
LMC-WR 23	...	rp500052	12.4	4			rp141519	1.1	32			rp110174	2.9	22
LMC-WR 24	Brey 19	rp900398	12.4	33			rp141542	1.6	32			rp110175	2.2	27
LMC-WR 25	Brey 19a	rp400263	24.1	34			rp141543	1.5	32			rp180251	20.2	17
LMC-WR 26	Brey 20	rp900398	12.4	37			rp141800	1.0	32			rp500100	26.6	18
LMC-WR 27	Brey 21	rp500061	3.8	11			rp141937	1.9	32			rp500140	40.0	17
LMC-WR 28	Brey 22	rp141507	1.3	29			rp142011	2.6	32			rp500303	9.4	17
		rp141508	1.1	30			rp142564	2.7	32			rp600100	22.7	18
		rp141518	1.3	31			rp142617	1.6	32	LMC-WR 61	Brey 50	rp110167	2.3	27
		rp141519	1.1	30			rp160084	1.7	32			rp110173	2.0	19
		rp141542	1.6	30			rp500004	1.1	32			rp110174	2.9	16
		rp141543	1.5	30			rp500138	31.6	21			rp110175	2.2	13
		rp141937	1.9	30			rp500141	11.4	32			rp110176	2.2	25
		rp142011	2.6	30	LMC-WR 45	Sk $-69^{\circ}142a$	rp500138	31.6	11			rp110182	2.0	28
		rp142617	1.6	30	LMC-WR 46	Brey 38	rp500138	31.6	15			rp120006	1.3	27
		rp160084	1.7	30	LMC-WR 47	Brey 39	rp500138	31.6	15			rp120101	1.8	27
		rp180033	3.6	31	LMC-WR 48	Brey 40	rp500138	31.6	16			rp180251	20.2	29
		rp300126	7.6	32	LMC-WR 49	Brey 40a	rp300335	11.3	36			rp180255	17.6	34
		rp500004	1.1	31	LMC-WR 50	Brey 41	rp180251	20.2	35			rp400079	7.4	27
		rp500141	11.4	30			rp500138	31.6	19			rp400148	6.0	34
		rp900398	12.4	31	LMC-WR 51	Brey 42	rp500138	31.6	1			rp400298	1.1	34
LMC-WR 29	Brey 23	rp500053	8.3	0	LMC-WR 52	Brey 43	rp500054	7.9	25			rp500100	26.6	29
LMC-WR 30	Brey 24	rp500053	8.3	21			rp900539	1.4	28			rp500140	40.0	29
		rp500062	5.9	24			rp900541	1.0	30			rp500303	9.4	29
		rp600578	10.5	37	LMC-WR 53	Brey 44	rp300335	11.3	32			rp600100	22.7	29

Table 1—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 62	Brey 51	rp400246	14.5	13			rp110179	2.2	32			rp900539	1.4	25
LMC-WR 63	Brey 52	rp900533	1.6	29			rp180251	20.2	4			rp900548	1.1	14
		rp900539	1.4	29			rp500100	26.6	4			rp900549	1.3	2
		rp900549	1.3	18			rp500140	40.0	4			rp900552	1.1	9
		rp900552	1.1	26			rp500303	9.4	4			rp900553	1.1	29
LMC-WR 64	Brey 53	rp110167	2.3	22	LMC-WR 69	TSWR 4	rp600100	22.7	4	LMC-WR 76	Brey 64	rp180251	20.2	17
		rp110170	2.1	33			rp110167	2.3	24			rp500100	26.6	17
		rp110173	2.0	21			rp110173	2.0	32			rp500140	40.0	17
		rp110174	2.9	12			rp110174	2.9	26			rp500303	9.4	17
		rp110175	2.2	11			rp110179	2.2	32			rp600100	22.7	17
		rp110176	2.2	28			rp180251	20.2	4	LMC-WR 77	Brey 65	rp110168	1.8	11
		rp110179	2.2	32			rp500100	26.6	4			rp110173	2.0	33
		rp110181	1.9	35			rp500140	40.0	4			rp110179	2.2	31
		rp110182	2.0	25			rp500303	9.4	4			rp180251	20.2	5
		rp120006	1.3	24			rp600100	22.7	4			rp500100	26.6	5
		rp120101	1.8	24	LMC-WR 70	Brey 62	rp110167	2.3	25			rp500140	40.0	5
		rp180251	20.2	28			rp110173	2.0	33			rp500303	9.4	5
		rp400079	7.4	24			rp110174	2.9	27			rp600100	22.7	4
		rp500140	40.0	28			rp110179	2.2	32	LMC-WR 78	Brey 65b	rp110168	1.8	11
		rp500303	9.4	28			rp180251	20.2	5			rp110173	2.0	33
		rp600100	22.7	28			rp500100	26.6	5			rp110179	2.2	31
LMC-WR 65	Brey 55	rp110167	2.3	30			rp500140	40.0	5			rp180251	20.2	5
		rp110173	2.0	35			rp500303	9.4	5			rp500100	26.6	5
		rp110174	2.9	33			rp600100	22.7	5			rp500140	40.0	5
		rp180251	20.2	10	LMC-WR 71	Brey 60	rp110167	2.3	34			rp500303	9.4	5
		rp500100	26.6	10			rp180251	20.2	16			rp600100	22.7	4
		rp500140	40.0	10			rp500100	26.6	16	LMC-WR 79	Brey 57	rp110168	1.8	11
		rp500303	9.4	10			rp500140	40.0	16			rp110173	2.0	33
		rp600100	22.7	10			rp500303	9.4	16			rp110179	2.2	31
LMC-WR 66	Brey 54	rp900532	1.2	20			rp600100	22.7	16			rp180251	20.2	5
		rp900533	1.6	21	LMC-WR 72	Brey 61	rp110167	2.3	35			rp500100	26.6	5
		rp900536	1.0	20			rp180251	20.2	17			rp500140	40.0	5
		rp900538	1.4	30			rp500100	26.6	17			rp500303	9.4	5
		rp900539	1.4	23			rp500140	40.0	17			rp600100	22.7	5
		rp900548	1.1	18			rp500303	9.4	17	LMC-WR 80	Brey 65c	rp110168	1.8	11
		rp900549	1.3	3			rp600100	22.7	17			rp110173	2.0	33
		rp900552	1.1	12	LMC-WR 73	Brey 63	rp180251	20.2	22			rp110179	2.2	31
		rp900553	1.1	29			rp500100	26.6	22			rp180251	20.2	5
LMC-WR 67	Brey 56	rp110167	2.3	23			rp500140	40.0	22			rp500100	26.6	5
		rp110173	2.0	31			rp500303	9.4	22			rp500140	40.0	5
		rp110174	2.9	26			rp600100	22.7	22			rp500303	9.4	5
		rp110179	2.2	32	LMC-WR 74	Brey 63a	rp180251	20.2	21			rp600100	22.7	4
		rp180251	20.2	3			rp500100	26.6	21	LMC-WR 81	Brey 65a	rp900533	1.6	33
		rp500100	26.6	3			rp500140	40.0	21			rp900549	1.3	32
		rp500140	40.0	3			rp500303	9.4	21	LMC-WR 82	Brey 66	rp110168	1.8	8
		rp500303	9.4	3			rp600100	22.7	21			rp110179	2.2	30
		rp600100	22.7	3	LMC-WR 75	Brey 59	rp900532	1.2	17			rp180251	20.2	8
LMC-WR 68	Brey 58	rp110167	2.3	24			rp900533	1.6	19			rp500100	26.6	8
		rp110173	2.0	32			rp900536	1.0	17			rp500140	40.0	8
		rp110174	2.9	26			rp900538	1.4	29			rp500303	9.4	8

Table 1—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 83	HD 269858	rp600100	22.7	8	LMC-WR 90	Brey 74	rp180251	20.2	14	LMC-WR 96	Brey 81	rp500140	40.0	19
		rp110168	1.8	28			rp500100	26.6	14			rp500303	9.4	19
		rp110173	2.0	29			rp500131	16.0	4			rp600100	22.7	19
		rp110179	2.2	21			rp500140	40.0	14			rp110168	1.8	9
		rp180251	20.2	15			rp500303	9.4	14			rp110179	2.2	26
LMC-WR 84	Brey 68	rp500100	26.6	15	LMC-WR 91	Brey 73	rp600100	22.7	13	LMC-WR 97	Mk 51	rp180251	20.2	19
		rp500140	40.0	15			rp110168	1.8	13			rp500100	26.6	19
		rp500303	9.4	15			rp110179	2.2	22			rp500131	16.0	0
		rp600100	22.7	14			rp180251	20.2	12			rp500140	40.0	19
		rp110168	1.8	24			rp500100	26.6	12			rp500303	9.4	19
LMC-WR 85	Brey 67	rp110173	2.0	30	LMC-WR 92	Brey 72	rp500131	16.0	8	LMC-WR 98	Brey 79	rp600100	22.7	18
		rp110179	2.2	20			rp500140	40.0	12			rp110168	1.8	9
		rp180251	20.2	12			rp500303	9.4	12			rp110179	2.2	26
		rp500100	26.6	12			rp600100	22.7	11			rp180251	20.2	19
		rp500140	40.0	12			rp110168	1.8	8			rp500100	26.6	19
LMC-WR 86	Brey 69	rp500303	9.4	12	LMC-WR 93	Brey 74a	rp110179	2.2	26	LMC-WR 101,102	R 140a	rp500131	16.0	0
		rp600100	22.7	11			rp180251	20.2	14			rp500140	40.0	19
		rp110168	1.8	5			rp500100	26.6	16			rp500303	9.4	19
		rp110179	2.2	29			rp500131	16.0	4			rp600100	22.7	18
		rp180251	20.2	12			rp500140	40.0	16			rp110168	1.8	9
LMC-WR 87	Brey 70	rp500100	26.6	12	LMC-WR 94	Brey 85	rp500303	9.4	16	LMC-WR 103	Brey 79	rp110179	2.2	27
		rp500131	16.0	7			rp600100	22.7	16			rp180251	20.2	20
		rp500140	40.0	12			rp110168	1.8	8			rp500100	26.6	20
		rp500303	9.4	12			rp110179	2.2	25			rp500131	16.0	1
		rp600100	22.7	11			rp180251	20.2	14			rp500140	40.0	20
LMC-WR 88	Brey 70a	rp110168	1.8	19	LMC-WR 95	Brey 80	rp500100	26.6	14	LMC-WR 104	Brey 76	rp500303	9.4	20
		rp110173	2.0	35			rp500131	16.0	4			rp600100	22.7	19
		rp110179	2.2	19			rp500140	40.0	14			rp110168	1.8	9
		rp180251	20.2	11			rp500303	9.4	14			rp110179	2.2	27
		rp500100	26.6	11			rp600100	22.7	13			rp180251	20.2	20
LMC-WR 89	Brey 71	rp500140	40.0	11	LMC-WR 96	Brey 81	rp110168	1.8	29	LMC-WR 99	Brey 82	rp500100	26.6	20
		rp500303	9.4	11			rp110179	2.2	11			rp500131	16.0	1
		rp600100	22.7	10			rp180251	20.2	20			rp500140	40.0	20
		rp110168	1.8	7			rp500100	26.6	20			rp500303	9.4	20
		rp110179	2.2	27			rp500140	40.0	20			rp600100	22.7	19
LMC-WR 90	Brey 74	rp180251	20.2	15	LMC-WR 97	Mk 51	rp600100	22.7	20	LMC-WR 100	Brey 83	rp110168	1.8	9
		rp500100	26.6	15			rp110168	1.8	8			rp110179	2.2	26
		rp500140	40.0	15			rp110179	2.2	28			rp180251	20.2	19
		rp500303	9.4	13			rp180251	20.2	19			rp500100	26.6	19
		rp600100	22.7	12			rp500100	26.6	12			rp500131	16.0	0
LMC-WR 91	Brey 73	rp110168	1.8	13	LMC-WR 98	Brey 79	rp500100	26.6	12	LMC-WR 101	Brey 84	rp500140	40.0	19
		rp110179	2.2	22			rp500131	16.0	8			rp600100	22.7	19
		rp180251	20.2	12			rp600100	22.7	12			rp110168	1.8	9
		rp500100	26.6	12			rp110179	2.2	22			rp110179	2.2	26
		rp500140	40.0	12			rp180251	20.2	11			rp500100	26.6	19
LMC-WR 92	Brey 72	rp500303	9.4	12	LMC-WR 99	Brey 82	rp110168	1.8	11	LMC-WR 102	Brey 85	rp500131	16.0	0
		rp600100	22.7	11			rp180251	20.2	12			rp500140	40.0	19
		rp110168	1.8	8			rp500100	26.6	12			rp600100	22.7	19
		rp110179	2.2	26			rp500131	16.0	8			rp110168	1.8	9
		rp180251	20.2	14			rp600100	22.7	16			rp110179	2.2	27
LMC-WR 93	Brey 74a	rp500303	9.4	12	LMC-WR 100	Brey 83	rp110179	2.2	29	LMC-WR 103	Brey 79	rp180251	20.2	19
		rp600100	22.7	11			rp180251	20.2	16			rp500100	26.6	19
		rp110168	1.8	5			rp500100	26.6	16			rp500131	16.0	0
		rp110179	2.2	29			rp500131	16.0	4			rp600100	22.7	18
		rp180251	20.2	16			rp500140	40.0	16			rp110168	1.8	9
LMC-WR 94	Brey 85	rp500100	26.6	16	LMC-WR 101	Brey 84	rp600100	22.7	16	LMC-WR 104	Brey 76	rp110179	2.2	27
		rp110168	1.8	8			rp110168	1.8	9			rp110179	2.2	26
		rp110179	2.2	25			rp180251	20.2	20			rp180251	20.2	19
		rp180251	20.2	14			rp500100	26.6	19			rp500100	26.6	19
		rp500100	26.6	14			rp500131	16.0	4			rp500140	40.0	20
LMC-WR 95	Brey 80	rp500131	16.0	4	LMC-WR 102	Brey 85	rp500140	40.0	14	LMC-WR 105	Brey 86	rp600100	22.7	19
		rp500303	9.4	14			rp500303	9.4	20			rp600100	22.7	19
		rp600100	22.7	13			rp600100	22.7	20			rp110168	1.8	9
		rp110168	1.8	29			rp110168	1.8	8			rp110179	2.2	26
		rp110179	2.2	11			rp180251	20.2	20			rp180251	20.2	19
LMC-WR 96	Brey 81	rp180251	20.2	12	LMC-WR 103	Brey 79	rp500100	26.6	12	LMC-WR 106	Brey 87	rp500140	40.0	19
		rp500100	26.6	12			rp500131	16.0	0			rp500303	9.4	20
		rp500131	16.0	8			rp500140	40.0	20			rp600100	22.7	19
		rp500140	40.0	12			rp500303	9.4	20			rp110168	1.8	9
		rp500303	9.4	12			rp600100	22.7	19			rp110179	2.2	26
LMC-WR 97	Mk 51	rp600100	22.7	11	LMC-WR 104	Brey 76	rp110168	1.8	9	LMC-WR 107	Brey 88	rp180251	20.2	19
		rp110168	1.8	11			rp110179	2.2	27			rp500100	26.6	19
		rp180251	20.2	12			rp180251	20.2	12			rp500131	16.0	0
		rp500100	26.6	12			rp500140	40.0	20			rp500140	40.0	19
		rp500140	40.0	12			rp500303	9.4	20			rp500303	9.4	19

Table 1—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)		
LMC-WR 105	Brey 77	rp600100	22.7	19	LMC-WR 118	Brey 89	rp110179	2.2	31	LMC-WR 124	Brey 93a	rp500303	9.4	39		
		rp110168	1.8	9			rp180251	20.2	23			rp600100	22.7	39		
		rp110179	2.2	26			rp500100	26.6	23			rp110179	2.2	10		
		rp180251	20.2	20			rp500131	16.0	6			rp180251	20.2	31		
		rp500100	26.6	19			rp500140	40.0	23			rp500100	26.6	31		
		rp500131	16.0	1			rp500303	9.4	23			rp500140	40.0	31		
LMC-WR 106,108,109,110	R 136a	rp500140	40.0	20	LMC-WR 119	Brey 90	rp600100	22.7	23	LMC-WR 125	Brey 94	rp500303	9.4	31		
		rp500303	9.4	20			rp110168	1.8	9			rp600100	22.7	31		
		rp600100	22.7	19			rp110179	2.2	30			rp110168	1.8	27		
		rp110168	1.8	9			rp180251	20.2	23			rp110179	2.2	7		
		rp110179	2.2	26			rp500100	26.6	23			rp180251	20.2	24		
		rp180251	20.2	20			rp500131	16.0	4			rp500100	26.6	24		
LMC-WR 107	Brey 86	rp500100	26.6	19	LMC-WR 120	Brey 91	rp500140	40.0	23	LMC-WR 126	Brey 95	rp500140	40.0	24		
		rp500131	16.0	1			rp500303	9.4	23			rp500303	9.4	24		
		rp500140	40.0	20			rp600100	22.7	22			rp600100	22.7	24		
		rp500303	9.4	20			rp110168	1.8	10			rp110168	1.8	27		
		rp600100	22.7	19			rp110179	2.2	26			rp110179	2.2	6		
		rp110168	1.8	9			rp180251	20.2	21			rp180251	20.2	25		
LMC-WR 111	R 136b	rp110179	2.2	26	LMC-WR 121	Brey 90a	rp500100	26.6	21	LMC-WR 127	Brey 95a	rp500100	26.6	25		
		rp180251	20.2	19			rp500131	16.0	2			rp500140	40.0	25		
		rp500100	26.6	19			rp500140	40.0	21			rp500303	9.4	25		
		rp500131	16.0	0			rp500303	9.4	21			rp600100	22.7	25		
		rp500140	40.0	19			rp600100	22.7	20			rp110168	1.8	27		
		rp500303	9.4	19			rp110168	1.8	29			rp110179	2.2	7		
LMC-WR 112	R 136c	rp600100	22.7	19	LMC-WR 122	Brey 92	rp110179	2.2	9	LMC-WR 128	Brey 96	rp180251	20.2	26		
		rp110168	1.8	9			rp180251	20.2	22			rp500100	26.6	26		
		rp110179	2.2	26			rp500100	26.6	22			rp500140	40.0	26		
		rp180251	20.2	19			rp500140	40.0	22			rp500303	9.4	26		
		rp500100	26.6	19			rp500303	9.4	22			rp600100	22.7	26		
		rp500131	16.0	0			rp600100	22.7	21			rp110179	2.2	4		
LMC-WR 113	Mk 30	rp500140	40.0	19	LMC-WR 123	Brey 93	rp110168	1.8	10	LMC-WR 129	Brey 97	rp150044	5.3	8		
		rp500303	9.4	19			rp110179	2.2	28			rp180251	20.2	30		
		rp600100	22.7	19			rp180251	20.2	22			rp400052	8.8	8		
		rp110168	1.8	9			rp500100	26.6	22			rp400079	7.4	18		
		rp110179	2.2	27			rp500131	16.0	3			rp400133	1.8	8		
		rp180251	20.2	20			rp500140	40.0	22			rp500100	26.6	30		
LMC-WR 117	Brey 88	rp500100	26.6	19	LMC-WR 124	Brey 93	rp500303	9.4	22	LMC-WR 130	Sk $-69^{\circ}297$	rp500140	40.0	30		
		rp500131	16.0	1			rp600100	22.7	22			rp600100	22.7	29		
		rp500140	40.0	20			rp110168	1.8	11			rp110169	1.8	18		
		rp500303	9.4	20			rp110179	2.2	29			rp300335	11.3	29		
		rp600100	22.7	19			rp180251	20.2	24			rp110179	2.2	22		
		rp110168	1.8	9			rp500100	26.6	24			rp150044	5.3	23		
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LMC-WR 117	Brey 88	rp110179	2.2	27	LMC-WR 125	Brey 94	rp500131	16.0	5	LMC-WR 131	Brey 98	rp400052	8.8	22		
		rp180251	20.2	20			rp500140	40.0	24			rp400133	1.8	22		
		rp500100	26.6	20			rp500303	9.4	24			rp900533	1.6	36		
		rp500131	16.0	1			rp600100	22.7	23			rp900533	1.6	36		
		rp500140	40.0	20			rp180251	20.2	39			LMC-WR 133	Sk $-67^{\circ}266$	rp900533	1.6	39
		rp500303	9.4	20			rp180179	15.9	39			SMC-WR 1	AV 2a	rp500249	19.2	21
LMC-WR 117	Brey 88	rp600100	22.7	19	LMC-WR 126	Brey 95	rp500100	26.6	39	LMC-WR 132	Brey 99	rp500251	2.1	33		
		rp110168	1.8	9			rp500140	40.0	39			rp600196	23.5	34		

Table 1—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
SMC-WR 2	AV 39a	rp600454	18.0	10	SMC-WR 5	HD 5980	rp500251	2.1	4	SMC-WR 10	...	rp500249	19.2	9
		rp500249	19.2	9			rp600196	23.5	13			rp500251	2.1	32
		rp500251	2.1	15			rp600454	18.0	35			rp600196	23.5	25
		rp600196	23.5	10			rp600195	26.1	9			rp600454	18.0	35
		rp600453	17.6	40			rp500142	4.9	6			rp600195	23.0	33
SMC-WR 3	AV 60a	rp600454	18.0	33	SMC-WR 6	Sk 108	rp500250	20.8	6	SMC-WR 11	...	rp600196	23.5	39
		rp500249	19.2	17			rp500142	4.9	3			rp600453	17.6	15
		rp500251	2.1	6			rp500250	20.8	5			rp500142	4.9	8
		rp600196	23.5	9			rp600195	23.0	33			rp500250	20.8	6
		rp600454	18.0	34			rp600196	23.5	33	SMC-WR 12	SMC-054730			
SMC-WR 4	Sk 41	rp500249	19.2	23			rp600453	17.6	1					

Table 2. ROSAT HRI Observations of WR Stars in the MCs

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 3	Brey 3	rh400654	2.6	7	LMC-WR 38	Brey 31	rh400353	7.9	13			rh400125	4.9	11
LMC-WR 9	Brey 7	rh900321	32.2	10			rh400355	4.5	16			rh400658	5.9	11
LMC-WR 10	Brey 9	rh900321	32.2	0	LMC-WR 39	Brey 32	rh400356	3.1	17			rh500470	28.7	17
LMC-WR 13	Sk-66° 40	rh900321	32.2	8			rh600646	23.7	9			rh500546	22.0	17
LMC-WR 14	Brey 11	rh400354	3.9	16	LMC-WR 40	Brey 33	rh400356	3.1	17			rh600775	19.7	14
LMC-WR 19	Brey 16	rh400239	3.1	9			rh600646	23.7	9			rh600776	20.8	5
		rh500174	11.3	10	LMC-WR 41	Brey 35	rh600033	1.7	6	LMC-WR 61	Brey 50	rh110290	1.7	12
LMC-WR 20	Brey 16a	rh400239	3.1	8			rh600641	26.1	18			rh110291	1.7	12
		rh500174	11.3	10			rh600646	23.7	9			rh400233	5.0	13
LMC-WR 22	Brey 18	rh400358	4.0	8	LMC-WR 42	Brey 34	rh400356	3.1	16			rh500234	17.7	10
LMC-WR 24	Brey 19	rh400358	4.0	9			rh600646	23.7	8			rh600650	2.1	9
		rh601033	16.4	10	LMC-WR 43	Brey 37	rh400127	1.9	16			rh600775	19.7	16
LMC-WR 25	Brey 19a	rh400359	5.7	13	LMC-WR 44	Brey 36	rh600033	1.7	0			rh600780	23.3	9
LMC-WR 26	Brey 20	rh400358	4.0	12			rh600641	26.5	3	LMC-WR 62	Brey 51	rh400456	14.2	13
		rh601033	16.4	16	LMC-WR 45	Sk-69° 142a	rh600033	1.7	11			rh400457	15.0	13
LMC-WR 27	Brey 21	rh500171	17.3	11			rh600641	26.5	11			rh400458	3.0	13
LMC-WR 28	Brey 22	rh400657	3.8	9			rh600646	23.7	8			rh400459	8.5	13
		rh600919	18.1	15	LMC-WR 46	Brey 38	rh600033	1.7	8			rh500173	2.7	13
LMC-WR 31	Brey 25	rh600913	110.6	4			rh600641	26.5	8	LMC-WR 63	Brey 52	rh400644	4.6	8
LMC-WR 32	Brey 26	rh600030	1.5	12			rh600646	23.9	11	LMC-WR 64	Brey 53	rh110290	1.7	9
LMC-WR 33	Sk-68° 73	rh600913	110.6	8	LMC-WR 47	Brey 39	rh400356	3.1	9			rh110291	1.7	10
LMC-WR 34	Brey 28	rh201848	2.2	13			rh600640	23.8	16			rh400233	5.0	13
LMC-WR 35	Brey 27	rh400066	21.0	18			rh600646	23.7	7			rh500234	17.1	12
		rh400828	9.5	18			rh600647	23.6	15			rh600650	2.1	8
		rh400829	4.3	18	LMC-WR 48	Brey 40	rh600640	23.8	14			rh600775	19.7	14
		rh400830	12.5	18			rh600641	26.1	16			rh600780	23.3	8
		rh400831	7.7	18			rh600646	23.7	7	LMC-WR 65	Brey 55	rh400056	23.4	10
		rh400832	12.4	18	LMC-WR 49	Brey 40a	rh600781	48.7	7			rh400779	106.0	14
		rh400833	9.6	18	LMC-WR 50	Brey 41	rh600033	1.7	15			rh500407	11.1	10
		rh400834	11.0	18			rh600635	21.0	15			rh500408	20.9	10
		rh400835	11.0	18			rh600640	23.8	15			rh500468	18.1	10
		rh400836	15.2	18			rh600641	26.5	12			rh500470	28.7	10
		rh400837	11.4	18			rh600646	23.7	13			rh500471	18.7	10
		rh400838	15.7	18	LMC-WR 51	Brey 42	rh400356	3.1	11			rh500546	22.0	10
		rh400839	10.8	18			rh600640	23.8	12			rh600634	23.6	15
		rh500172	29.0	14			rh600646	23.7	10	LMC-WR 66	Brey 54	rh400644	4.6	12
LMC-WR 37	Brey 30	rh400066	21.0	11	LMC-WR 52	Brey 43	rh400355	4.6	8	LMC-WR 67	Brey 56	rh400056	23.4	3
		rh400828	9.5	11	LMC-WR 53	Brey 44	rh600781	48.7	0			rh400779	106.0	13
		rh400829	4.3	11	LMC-WR 54	Brey 44a	rh400125	4.9	11			rh500407	11.1	3
		rh400830	12.5	11			rh600635	21.0	4			rh500408	20.9	3
		rh400831	7.7	11			rh600641	26.1	16			rh500468	18.1	3
		rh400832	12.4	11			rh400658	5.8	11			rh500470	28.7	3
		rh400833	9.6	11	LMC-WR 55	Sk-69° 175	rh400125	4.9	14			rh500471	18.7	3
		rh400834	11.0	11			rh600635	21.0	6			rh500546	22.0	3
		rh400835	11.0	11			rh600640	23.8	15	LMC-WR 68	Brey 58	rh400056	23.4	4
		rh400836	15.2	11			rh400658	5.8	14			rh400779	106.0	12
		rh400837	11.4	11	LMC-WR 56	Brey 46	rh400234	6.4	7			rh500407	11.1	4
		rh400838	15.7	11	LMC-WR 58	Brey 47	rh600645	19.0	4			rh500408	20.9	4
		rh400839	10.8	11	LMC-WR 59	Brey 48	rh400234	6.4	1			rh500468	18.1	4
		rh500172	29.0	15	LMC-WR 60	Brey 49	rh400056	23.4	17			rh500470	28.7	4

Table 2—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 69	TSWR 4	rh500471	18.7	4	LMC-WR 77	Brey 65	rh600634	23.6	8	LMC-WR 84	Brey 68	rh500468	18.1	15
		rh500546	22.0	4			rh400056	23.4	5			rh500470	28.7	15
		rh400056	23.4	4			rh400779	106.0	11			rh500471	18.7	15
		rh400779	106.0	12			rh500407	11.1	5			rh500546	22.0	15
		rh500407	11.1	4			rh500408	20.9	5			rh600774	22.4	15
		rh500408	20.9	4			rh500468	18.1	5			rh600775	19.7	4
		rh500468	18.1	4			rh500470	28.7	5			rh400056	23.4	12
LMC-WR 70	Brey 62	rh500470	28.7	4	LMC-WR 78	Brey 65b	rh500471	18.7	5	LMC-WR 85	Brey 67	rh500407	11.1	12
		rh500471	18.7	4			rh500546	22.0	5			rh500408	20.9	12
		rh500546	22.0	4			rh600228	30.2	15			rh500468	18.1	12
		rh400056	23.4	5			rh400056	23.4	5			rh500470	28.7	12
		rh400779	106.0	12			rh400779	106.0	11			rh500471	18.7	12
		rh500407	11.1	5			rh500407	11.1	5			rh500546	22.0	12
		rh500408	20.9	5			rh500408	20.9	5			rh600774	22.4	15
LMC-WR 71	Brey 60	rh500468	18.1	5	LMC-WR 79	Brey 57	rh500468	18.1	5	LMC-WR 86	Brey 69	rh600775	19.7	6
		rh500470	28.7	5			rh500470	28.7	5			rh400056	23.4	8
		rh500471	18.7	5			rh500471	18.7	5			rh400779	106.0	6
		rh500546	22.0	5			rh500546	22.0	5			rh500407	11.1	8
		rh400056	23.4	16			rh600228	30.2	15			rh500408	20.9	8
		rh400779	106.0	14			rh400056	23.4	5			rh500468	18.1	8
		rh500407	11.1	16			rh400779	106.0	11			rh500470	28.7	8
LMC-WR 72	Brey 61	rh500408	20.9	16	LMC-WR 80	Brey 65c	rh500407	11.1	5	LMC-WR 87	Brey 70	rh500471	18.7	8
		rh500468	18.1	16			rh500408	20.9	5			rh500546	22.0	8
		rh500470	28.7	16			rh500468	18.1	5			rh600228	30.2	11
		rh500471	18.7	16			rh500470	28.7	5			rh400056	23.4	12
		rh500546	22.0	16			rh500471	18.7	5			rh400779	106.0	4
		rh600634	23.6	8			rh500546	22.0	5			rh500407	11.1	12
		rh400056	23.4	17			rh600228	30.2	15			rh500408	20.9	12
LMC-WR 73	Brey 63	rh400779	106.0	15	LMC-WR 81	Brey 65a	rh400056	23.4	5	LMC-WR 88	Brey 70a	rh500468	18.1	12
		rh500407	11.1	17			rh400779	106.0	11			rh500470	28.7	12
		rh500408	20.9	17			rh500407	11.1	5			rh500471	18.7	12
		rh500468	18.1	17			rh500408	20.9	5			rh500546	22.0	12
		rh500470	28.7	17			rh500468	18.1	5			rh600228	30.2	8
		rh500471	18.7	17			rh500470	28.7	5			rh600228	30.2	14
		rh500546	22.0	17			rh500471	18.7	5			rh400056	23.4	11
LMC-WR 74	Brey 63a	rh600634	23.6	7	LMC-WR 82	Brey 66	rh500546	22.0	5			rh400779	106.0	13
		rh400779	106.0	17			rh600228	30.2	15			rh500407	11.1	11
LMC-WR 75	Brey 59	rh600634	23.6	2	LMC-WR 83	HD 269858	rh400644	4.6	16			rh500408	20.9	11
		rh400779	106.0	18			rh400056	23.4	8			rh500468	18.1	11
LMC-WR 76	Brey 64	rh600634	23.6	4			rh400779	106.0	7			rh500470	28.7	11
		rh400644	4.6	15			rh500407	11.1	5			rh500471	18.7	11
LMC-WR 76	Brey 64	rh400056	23.4	17			rh500408	20.9	5			rh500546	22.0	11
		rh400779	106.0	14			rh500468	18.1	5			rh600228	30.2	16
LMC-WR 76	Brey 64	rh500407	11.1	17			rh500470	28.7	5			rh600774	22.4	15
		rh500408	20.9	17			rh500471	18.7	5			rh600775	19.7	12
LMC-WR 76	Brey 64	rh500468	18.1	17			rh500546	22.0	5			rh400056	23.4	13
		rh500470	28.7	17			rh600228	30.2	11			rh400779	106.0	2
LMC-WR 76	Brey 64	rh500471	18.7	17			rh400056	23.4	15			rh500407	11.1	13
		rh500546	22.0	17			rh500407	11.1	15			rh500408	20.9	13
		rh600228	30.2	16			rh500408	20.9	15			rh500468	18.1	13

Table 2—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 89	Brey 71	rh500470	28.7	13	LMC-WR 94	Brey 85	rh500546	22.0	14	LMC-WR 107	Brey 86	rh400779	106.0	4
		rh500471	18.7	13			rh600228	30.2	5			rh500036	8.8	6
		rh500546	22.0	13			rh100193	39.7	15			rh600228	30.2	1
		rh600228	30.2	6			rh150008	18.1	13			rh600633	21.5	14
		rh400056	23.4	14			rh600774	22.4	6			rh400779	106.0	4
		rh400779	106.0	1	LMC-WR 95	Brey 80	rh600775	19.7	13	LMC-WR 111	R 136b	rh500036	8.8	6
		rh500407	11.1	14			rh400779	106.0	4			rh600228	30.2	0
		rh500408	20.9	14			rh500036	8.8	6			rh600633	21.5	15
		rh500468	18.1	14			rh600228	30.2	1			rh400779	106.0	4
		rh500470	28.7	14			rh600633	21.5	15	LMC-WR 112	R 136c	rh500036	8.8	6
LMC-WR 90	Brey 74	rh500471	18.7	14	LMC-WR 96	Brey 81	rh400779	106.0	3			rh600228	30.2	0
		rh500546	22.0	14			rh500036	8.8	5			rh600633	21.5	15
		rh600228	30.2	5			rh600228	30.2	1			rh400779	106.0	4
		rh150008	18.1	14			rh600633	21.5	16	LMC-WR 113	Mk 30	rh500036	8.8	6
		rh400056	23.4	12	LMC-WR 97	Mk 51	rh400779	106.0	3			rh600228	30.2	0
		rh400779	106.0	6			rh500036	8.8	5			rh600633	21.5	15
		rh500407	11.1	12			rh600228	30.2	0	LMC-WR 114	Mk 35	rh400779	106.0	4
		rh500408	20.9	12			rh600633	21.5	16			rh500036	8.8	5
		rh500468	18.1	12	LMC-WR 98	Brey 79	rh400779	106.0	3			rh600228	30.2	0
		rh500470	28.7	12			rh500036	8.8	5			rh600633	21.5	16
		rh500471	18.7	12			rh600228	30.2	0	LMC-WR 115	Brey 83	rh400779	106.0	4
LMC-WR 91	Brey 73	rh500546	22.0	12			rh600633	21.5	16			rh500036	8.8	6
		rh600228	30.2	9	LMC-WR 99	Brey 78	rh400779	106.0	4			rh600228	30.2	0
		rh150008	18.1	16			rh500036	8.8	5	LMC-WR 116	Brey 84	rh600633	21.5	15
		rh400056	23.4	14			rh600228	30.2	0			rh400779	106.0	4
		rh400779	106.0	1			rh600633	21.5	15			rh500036	8.8	6
		rh500407	11.1	14	LMC-WR 100	Brey 75	rh400779	106.0	4			rh600228	30.2	0
		rh500408	20.9	14			rh500036	8.8	6	LMC-WR 117	Brey 88	rh600633	21.5	15
		rh500468	18.1	14			rh600228	30.2	0			rh400779	106.0	8
		rh500470	28.7	14			rh600633	21.5	15			rh500036	8.8	10
		rh500471	18.7	14	LMC-WR 101,102	R 140a	rh400779	106.0	4			rh600228	30.2	5
LMC-WR 92	Brey 72	rh500546	22.0	14			rh500036	8.8	6	LMC-WR 118	Brey 89	rh600633	21.5	10
		rh600228	30.2	5			rh600228	30.2	0			rh400779	106.0	7
		rh400056	23.4	16			rh600633	21.5	15			rh500036	8.8	9
		rh400779	106.0	2	LMC-WR 103	Brey 79	rh400779	106.0	4			rh600228	30.2	4
		rh500407	11.1	16			rh500036	8.8	6	LMC-WR 119	Brey 90	rh600633	21.5	11
		rh500408	20.9	16			rh600228	30.2	0			rh400779	106.0	5
		rh500468	18.1	16			rh600633	21.5	15			rh500036	8.8	7
		rh500470	28.7	16	LMC-WR 104	Brey 76	rh400779	106.0	4			rh600228	30.2	1
		rh500471	18.7	16			rh500036	8.8	5	LMC-WR 120	Brey 91	rh600633	21.5	15
		rh500546	22.0	16			rh600228	30.2	0			rh100193	39.7	15
LMC-WR 93	Brey 74a	rh600228	30.2	4			rh600633	21.5	16			rh150008	18.1	11
		rh150008	18.1	15	LMC-WR 105	Brey 77	rh400779	106.0	4			rh600774	22.4	3
		rh400056	23.4	14			rh500036	8.8	6	LMC-WR 121	Brey 90a	rh600775	19.7	16
		rh400779	106.0	2			rh600228	30.2	0			rh400779	106.0	6
		rh500407	11.1	14			rh600633	21.5	15			rh500036	8.8	9
		rh500408	20.9	14	LMC-WR 106,108,109,110	R 136a	rh400779	106.0	4			rh600228	30.2	2
		rh500468	18.1	14			rh500036	8.8	6	LMC-WR 122	Brey 92	rh600633	21.5	13
		rh500470	28.7	14			rh600228	30.2	0			rh400779	106.0	8
		rh500471	18.7	14			rh600633	21.5	15			rh500036	8.8	10

Table 2—Continued

WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)	WR #	WR Name	Obs. ID	t_{exp} (ks)	Offset (arcmin)
LMC-WR 123	Brey 93	rh600228	30.2	4	SMC-WR 1	AV 2a	rh400340	5.2	15	SMC-WR 6	Sk 108	rh500418	28.8	0
		rh600633	21.5	11	SMC-WR 2	AV 39a	rh600929	24.5	13			rh900445	49.5	0
		rh400349	6.5	11			rh601045	9.5	4			rh500003	21.9	6
		rh600633	21.5	6			rh300513	1.6	16			rh500137	14.1	3
LMC-WR 124	Brey 93a	rh600638	25.7	13	SMC-WR 3	AV 60a	rh400340	5.2	10	SMC-WR 7	AV 336a	rh500003	21.9	6
		rh100193	39.7	5			rh500136	12.0	9	SMC-WR 9	MG 9	rh500137	14.1	3
		rh600774	22.4	8			rh500419	15.7	13			rh400237	3.6	9
		rh600779	26.2	11			rh600812	28.5	15			rh600808	27.4	15
LMC-WR 125	Brey 94	rh150008	18.1	4	SMC-WR 4	Sk 41	rh300513	1.6	16	SMC-WR 10	...	rh400340	5.2	16
LMC-WR 126	Brey 95	rh600774	22.4	6			rh400335	3.8	14	SMC-WR 11	...	rh500136	12.0	9
		rh150008	18.1	4			rh400340	5.2	10			rh180240	7.5	7
LMC-WR 127	Brey 95a	rh600774	22.4	6			rh500419	15.7	5			rh400237	3.6	6
		rh150008	18.1	4	SMC-WR 5	HD 5980	rh600811	27.4	17			rh600810	27.4	14
LMC-WR 128	Brey 96	rh600774	22.4	7			rh600812	28.5	8	SMC-WR 12	SMC-054730	rh601048	2.9	14
		rh150008	18.1	7			rh300513	1.6	11			rh500003	21.9	7
LMC-WR 130	Sk−69°297	rh600773	15.9	14			rh400335	3.8	9			rh500137	14.1	3
		rh600774	22.4	7			rh500419	15.7	6			rh500418	28.8	16
		rh600632	26.7	11			rh600812	28.5	7			rh900445	34.6	16
		rh600773	15.9	11			rh400337	5.0	13					

Table 3. WR Stars in the MCs Detected by ROSAT Observations

WR #	WR Name	Instrument	t_{exp} (ks)	Count Rate (cnts s ⁻¹)	Counts (cnts)	$L_{0.5-7.0\text{keV}}$ (ergs s ⁻¹)
LMC-WR 10	Brey 9	PSPC	50.8	1.2×10^{-3}	61 ± 10	$(6.7 \pm 1.1) \times 10^{33}$
LMC-WR 38	Brey 31	PSPC	23.1	9.8×10^{-4}	23 ± 6	$(5.4 \pm 1.4) \times 10^{33}$
		HRI	12.4	2.2×10^{-3}	28 ± 8	$(3.2 \pm 0.9) \times 10^{34}$
LMC-WR 39	Brey 32	PSPC	31.6	1.0×10^{-3}	31 ± 9	$(5.5 \pm 1.8) \times 10^{33}$
LMC-WR 42	Brey 34	PSPC	31.6	1.2×10^{-3}	37 ± 9	$(6.7 \pm 1.1) \times 10^{33}$
		HRI	26.8	6.0×10^{-4}	16 ± 8	$(8.6 \pm 4.3) \times 10^{33}$
LMC-WR 47	Brey 39	PSPC	31.6	7.6×10^{-4}	24 ± 9	$(4.2 \pm 1.6) \times 10^{33}$
LMC-WR 101-103	R 140a,b	HRI	134.8	2.9×10^{-3}	390 ± 30	$(1.6 \pm 0.1) \times 10^{35}$
LMC-WR 116	Brey 84	HRI	143.5	4.7×10^{-3}	670 ± 30	$(1.7 \pm 0.1) \times 10^{35}$

Table 4. Correlation of X-ray Detected WR Stars in the MCs with Other ROSAT Catalogs

WR #	This Paper HRI Count Rate (cnts s ⁻¹)	1RXH		This Paper PSPC Count Rate (cnts s ⁻¹)	2RXP		1WGA		1RXS	
		Source Name	Count Rate (cnts s ⁻¹)		Source Name	Count Rate (cnts s ⁻¹)	Source Name	Count Rate (cnts s ⁻¹)	Source Name	Count Rate (cnts s ⁻¹)
LMC-WR 10	...	J045633.1-662828	8.5×10^{-4}	1.2×10^{-3}	J045635.7-662815	9.7×10^{-3}	J0456.5-6628	1.6×10^{-3}	045635.6-662819	2.8×10^{-2}
LMC-WR 38	2.2×10^{-3}	J052605.4-672958	2.9×10^{-3}	9.8×10^{-4}	J052604.8-673002	3.8×10^{-3}	J0526.0-6730	1.8×10^{-3}	...	...
LMC-WR 39	...	...	...	1.0×10^{-3}	...	...	J0526.4-6850	2.4×10^{-3}	...	...
LMC-WR 42	6.0×10^{-4}	...	...	1.2×10^{-3}	J052643.4-684950	3.3×10^{-3}	...	...	...	...
LMC-WR 101-103	2.9×10^{-3}		5.8×10^{-3}	...	...	...		1.9×10^{-2}	...	...
LMC-WR 116	4.7×10^{-3}		3.9×10^{-3}	...	J053844.8-690602	1.3×10^{-1}		4.6×10^{-2}	...	...

Table 5. WR Stars in the MCs Undetected by ROSAT Observations

WR #	WR Name	Instrument	t_{exp} (ks)	3σ Upper Limit (cnts s $^{-1}$)	WR #	WR Name	Instrument	t_{exp} (ks)	3σ Upper Limit (cnts s $^{-1}$)
LMC-WR 3	Brey 3	PSPC	31.3	6.5×10^{-4}	LMC-WR 50	Brey 41	PSPC	51.8	5.5×10^{-4}
		HRI	2.6	2.7×10^{-3}			HRI	96.7	4.6×10^{-4}
LMC-WR 5	Brey 4	PSPC	13.8	1.4×10^{-3}	LMC-WR 51	Brey 42	PSPC	31.6	7.4×10^{-4}
LMC-WR 6	Brey 5	PSPC	12.7	1.2×10^{-3}			HRI	50.6	7.1×10^{-4}
LMC-WR 7	Brey 6	PSPC	12.7	9.5×10^{-4}	LMC-WR 52	Brey 43	PSPC	10.0	1.0×10^{-3}
LMC-WR 9	Brey 7	PSPC	50.8	4.2×10^{-4}			HRI	4.6	3.9×10^{-3}
		HRI	32.2	6.5×10^{-4}	LMC-WR 53	Brey 44	PSPC	10.9	1.2×10^{-3}
LMC-WR 10	Brey 9	HRI	32.2	7.3×10^{-4}			HRI	48.7	6.2×10^{-4}
LMC-WR 11	Brey 10	PSPC	13.8	9.7×10^{-4}	LMC-WR 54	Brey 44a	PSPC	157.9	2.7×10^{-4}
LMC-WR 12	Brey 10a	PSPC	12.7	1.1×10^{-3}			HRI	57.8	7.9×10^{-4}
LMC-WR 13	Sk $-66^{\circ}40$	PSPC	50.8	4.0×10^{-4}	LMC-WR 55	Sk $-69^{\circ}175$	PSPC	154.1	2.8×10^{-4}
		HRI	32.2	5.8×10^{-4}			HRI	55.5	8.6×10^{-4}
LMC-WR 14	Brey 11	PSPC	13.8	1.0×10^{-3}	LMC-WR 56	Brey 46	PSPC	7.9	2.4×10^{-3}
		HRI	3.9	3.5×10^{-3}			HRI	6.4	2.0×10^{-3}
LMC-WR 15	Brey 12	PSPC	3.9	4.1×10^{-3}	LMC-WR 57	Brey 45	PSPC	16.3	1.4×10^{-3}
LMC-WR 16	Brey 13	PSPC	19.5	1.2×10^{-3}	LMC-WR 58	Brey 47	PSPC	31.6	1.0×10^{-3}
LMC-WR 19	Brey 16	PSPC	10.8	2.3×10^{-3}			HRI	19.0	7.2×10^{-4}
		HRI	14.3	1.4×10^{-3}	LMC-WR 59	Brey 48	HRI	6.4	2.3×10^{-3}
LMC-WR 20	Brey 16a	PSPC	10.8	2.4×10^{-3}	LMC-WR 60	Brey 49	PSPC	128.3	6.3×10^{-4}
		HRI	14.3	1.4×10^{-3}			HRI	125.4	3.5×10^{-4}
LMC-WR 21	Brey 17	PSPC	12.4	1.3×10^{-3}	LMC-WR 61	Brey 50	PSPC	167.7	4.9×10^{-4}
LMC-WR 22	Brey 18	PSPC	16.0	6.8×10^{-4}			HRI	70.6	5.1×10^{-4}
		HRI	4.0	2.4×10^{-3}	LMC-WR 62	Brey 51	PSPC	14.5	1.0×10^{-3}
LMC-WR 23	...	PSPC	12.4	1.3×10^{-3}			HRI	43.4	6.5×10^{-4}
LMC-WR 24	Brey 19	PSPC	12.4	2.0×10^{-3}	LMC-WR 63	Brey 52	PSPC	5.4	4.3×10^{-3}
		HRI	20.4	8.1×10^{-4}			HRI	4.6	1.8×10^{-3}
LMC-WR 25	Brey 19a	PSPC	24.1	1.8×10^{-3}	LMC-WR 64	Brey 53	PSPC	122.6	7.7×10^{-4}
LMC-WR 26	Brey 20	PSPC	12.4	2.7×10^{-3}			HRI	706.	5.6×10^{-4}
		HRI	20.4	8.3×10^{-4}	LMC-WR 65	Brey 55	PSPC	126.1	5.0×10^{-4}
LMC-WR 27	Brey 21	PSPC	3.8	4.0×10^{-3}			HRI	272.5	1.7×10^{-4}
		HRI	17.3	9.9×10^{-4}	LMC-WR 66	Brey 54	PSPC	11.2	1.8×10^{-3}
LMC-WR 28	Brey 22	PSPC	52.2	3.9×10^{-4}			HRI	4.6	1.8×10^{-3}
		HRI	21.9	7.5×10^{-4}	LMC-WR 67	Brey 56	PSPC	124.9	7.5×10^{-4}
LMC-WR 29	Brey 23	PSPC	8.3	1.5×10^{-3}			HRI	248.9	1.9×10^{-4}
LMC-WR 30	Brey 24	PSPC	33.5	3.5×10^{-4}	LMC-WR 68	Brey 58	PSPC	124.9	7.7×10^{-4}
LMC-WR 31	Brey 25	HRI	110.6	3.7×10^{-4}			HRI	248.9	1.9×10^{-4}
LMC-WR 32	Brey 26	PSPC	24.1	5.5×10^{-4}	LMC-WR 69	TSWR 4	PSPC	124.9	7.7×10^{-4}
		HRI	1.5	4.8×10^{-3}			HRI	248.9	1.9×10^{-4}
LMC-WR 33	Sk $-68^{\circ}73$	PSPC	15.2	1.0×10^{-3}	LMC-WR 70	Brey 62	PSPC	124.9	7.9×10^{-4}
		HRI	110.6	3.2×10^{-4}			HRI	248.9	1.9×10^{-4}
LMC-WR 34	Brey 28	PSPC	24.1	3.4×10^{-4}	LMC-WR 71	Brey 60	PSPC	121.2	5.4×10^{-4}
		HRI	2.2	3.2×10^{-3}			HRI	272.5	1.6×10^{-4}
LMC-WR 35	Brey 27	PSPC	25.2	6.0×10^{-4}	LMC-WR 72	Brey 61	PSPC	121.2	5.3×10^{-4}
		HRI	179.0	2.7×10^{-4}			HRI	272.5	1.7×10^{-4}
LMC-WR 36	Brey 29	PSPC	31.6	1.5×10^{-3}	LMC-WR 73	Brey 63	PSPC	118.9	4.5×10^{-4}
LMC-WR 37	Brey 30	PSPC	25.2	6.0×10^{-4}			HRI	129.6	2.3×10^{-4}
		HRI	179.0	3.0×10^{-4}	LMC-WR 74	Brey 63a	PSPC	118.9	4.6×10^{-4}
LMC-WR 39	Brey 32	HRI	26.8	9.3×10^{-4}			HRI	129.6	2.6×10^{-4}
LMC-WR 40	Brey 33	PSPC	34.3	3.7×10^{-4}	LMC-WR 75	Brey 59	PSPC	11.2	1.8×10^{-3}
		HRI	26.8	8.7×10^{-4}			HRI	4.6	1.8×10^{-3}
LMC-WR 41	Brey 35	PSPC	31.6	6.5×10^{-4}	LMC-WR 76	Brey 64	PSPC	118.9	2.9×10^{-4}
		HRI	51.5	6.7×10^{-4}			HRI	302.6	1.5×10^{-4}
LMC-WR 43	Brey 37	PSPC	13.1	1.8×10^{-3}	LMC-WR 77	Brey 65	PSPC	124.9	7.6×10^{-4}
		HRI	1.9	4.3×10^{-3}			HRI	302.6	1.6×10^{-4}
LMC-WR 44	Brey 36	PSPC	64.0	4.3×10^{-4}	LMC-WR 78	Brey 65b	PSPC	124.9	7.6×10^{-4}
		HRI	28.2	1.2×10^{-3}			HRI	302.6	1.6×10^{-4}
LMC-WR 45	Sk $-69^{\circ}142a$	PSPC	31.6	3.3×10^{-4}	LMC-WR 79	Brey 57	PSPC	124.9	7.6×10^{-4}
		HRI	51.5	4.8×10^{-4}			HRI	302.6	1.6×10^{-4}
LMC-WR 46	Brey 38	PSPC	31.6	7.0×10^{-4}	LMC-WR 80	Brey 65c	PSPC	124.9	7.6×10^{-4}
		HRI	51.5	5.7×10^{-4}	LMC-WR 81	Brey 65a	HRI	4.6	1.8×10^{-3}
LMC-WR 47	Brey 39	PSPC	31.6	7.6×10^{-4}	LMC-WR 82	Brey 66	HRI	279.1	1.8×10^{-4}
		HRI	74.2	4.9×10^{-4}	LMC-WR 83	HD 269858	PSPC	124.9	6.0×10^{-4}
LMC-WR 48	Brey 40	PSPC	31.6	7.7×10^{-4}			HRI	185.0	2.4×10^{-4}
		HRI	73.6	5.2×10^{-4}	LMC-WR 84	Brey 68	HRI	185.0	2.6×10^{-4}
LMC-WR 49	Brey 40a	PSPC	11.3	1.5×10^{-3}	LMC-WR 86	Brey 69	PSPC	138.9	5.0×10^{-4}

Table 5—Continued

WR #	WR Name	Instrument	t_{exp} (ks)	3σ Upper Limit (cnts s ⁻¹)	WR #	WR Name	Instrument	t_{exp} (ks)	3σ Upper Limit (cnts s ⁻¹)
LMC-WR 87	Brey 70	HRI	48.7	8.3×10^{-4}	LMC-WR 128	Brey 96	HRI	279.1	1.7×10^{-4}
		PSPC	124.9	6.9×10^{-4}			PSPC	135.0	5.7×10^{-4}
LMC-WR 88	Brey 70a	HRI	321.1	1.6×10^{-4}	LMC-WR 129	Brey 97	HRI	56.4	7.1×10^{-4}
		HRI	279.1	1.7×10^{-4}			PSPC	13.1	1.2×10^{-3}
LMC-WR 89	Brey 71	HRI	279.1	1.6×10^{-4}	LMC-WR 130	Sk $-69^\circ 297$	PSPC	18.1	2.6×10^{-3}
LMC-WR 90	Brey 74	PSPC	138.9	5.1×10^{-4}			HRI	42.6	7.0×10^{-4}
		HRI	279.1	1.7×10^{-4}	LMC-WR 131	Brey 98	PSPC	1.6	6.5×10^{-3}
LMC-WR 94	Brey 85	PSPC	138.9	4.5×10^{-4}	LMC-WR 132	Brey 99	PSPC	1.6	5.7×10^{-3}
		HRI	99.9	4.3×10^{-4}	LMC-WR 133	Sk $-67^\circ 266$	PSPC	1.6	7.1×10^{-3}
LMC-WR 95	Brey 80	HRI	166.5	3.3×10^{-4}	SMC-WR 1	AV 2a	PSPC	62.8	8.9×10^{-4}
LMC-WR 96	Brey 81	HRI	166.5	3.0×10^{-4}			HRI	39.2	6.8×10^{-4}
LMC-WR 97	Mk 51	HRI	166.5	3.0×10^{-4}	SMC-WR 2	AV 39a	PSPC	80.4	7.0×10^{-4}
LMC-WR 98	Brey 79	HRI	166.5	3.0×10^{-4}			HRI	63.0	5.8×10^{-4}
LMC-WR 117	Brey 88	HRI	166.5	2.6×10^{-4}	SMC-WR 3	AV 60a	PSPC	62.8	6.9×10^{-4}
LMC-WR 119	Brey 90	HRI	166.5	2.7×10^{-4}			HRI	82.2	4.9×10^{-4}
LMC-WR 120	Brey 91	PSPC	122.9	6.4×10^{-4}	SMC-WR 4	Sk 41	PSPC	62.8	8.4×10^{-4}
		HRI	99.9	4.5×10^{-4}			HRI	49.6	7.2×10^{-4}
LMC-WR 121	Brey 90a	HRI	166.5	2.1×10^{-4}	SMC-WR 6	Sk 108	PSPC	25.7	1.0×10^{-3}
LMC-WR 122	Brey 92	HRI	166.5	2.3×10^{-4}			HRI	36.0	1.3×10^{-3}
LMC-WR 123	Brey 93	PSPC	115.5	1.0×10^{-3}	SMC-WR 7	AV 336a	PSPC	25.7	7.0×10^{-4}
		HRI	53.7	5.7×10^{-4}			HRI	36.0	1.2×10^{-3}
LMC-WR 124	Brey 93a	PSPC	121.1	7.3×10^{-4}	SMC-WR 9	MG 9	PSPC	64.1	6.8×10^{-4}
		HRI	88.3	5.1×10^{-4}			HRI	31.0	8.5×10^{-4}
LMC-WR 125	Brey 94	PSPC	121.1	6.8×10^{-4}	SMC-WR 10	...	PSPC	62.8	9.7×10^{-4}
		HRI	40.5	8.2×10^{-4}			HRI	17.2	1.1×10^{-3}
LMC-WR 126	Brey 95	PSPC	121.1	6.9×10^{-4}	SMC-WR 11	...	PSPC	64.1	7.0×10^{-4}
		HRI	40.5	9.0×10^{-4}			HRI	41.4	7.1×10^{-4}
LMC-WR 127	Brey 95a	PSPC	121.1	7.1×10^{-4}	SMC-WR 12	SMC-054730	PSPC	25.7	6.0×10^{-4}
		HRI	40.5	9.2×10^{-4}			HRI	99.4	4.7×10^{-4}

Figure 1.

ROSAT HRI (*left*) and PSPC (*center*) smoothed X-ray and DSS optical (*right*) images of the WR stars in the MCs with detected X-ray emission. The *ROSAT* HRI and PSPC images are overlaid with their corresponding X-ray contours, while the optical DSS images are overlaid with the PSPC X-ray contours. The X-ray contour levels are 3σ , 6σ , 9σ , 12σ , 15σ , 25σ , 35σ , ... above the background level. The positions of WR stars in the LMC given by Breysacher et al. (1999) are marked with a '+' sign.

Figure 2.

ROSAT HRI smoothed X-ray (*left*) and *HST* optical (*right*) images of R 136 (*top*) and R 140 (*bottom*). As in Fig. 1, the *ROSAT* HRI and *HST* images are overlaid with X-ray contours at 3σ , 6σ , 9σ , 12σ , 15σ , 25σ , 35σ , ... above the background level, and the “+” sign marks the locations of WR stars in the LMC given by Breysacher et al. (1999).

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